

## AMENDMENTS TO THE CLAIMS

1-13. (canceled)

14. (currently amended) A method for determining an organism, the method comprising:

~~assaying a plurality of enzymes with a sensor to determine a suite of enzymes expressed by the organism, and thus determining said organism;~~

identifying a presence of an organism using [[the]]a sensor comprising:

a substrate;

more than one pair of electrodes; and

a sol gel matrix comprising:

more than one sol-gel enzyme;

at least one reactant; and

at least one inherently conductive polymer transducer material,

wherein each of the more than one sol-gel enzymes is associated with at least one of the more than one pair of electrodes; and

wherein (a) an organism expresses at least one organism-enzyme on the surface of the sensor; (b) the at least one organism-enzyme causes a reaction with the at least one reactant of the sensor; (c) the product according to process step (b) reacts further with said more than one sol-gel enzyme of the sensor; (d) the products of process step (c) ~~modulate at least one property~~ an electrical resistance of the transducer material; (e) and the modulated property is measured.

15. (canceled)

16. (previously presented) The method of claim 14, wherein said products of process step (c) include one or more from the group of lactic acid, carbon dioxide, hydrogen, ethanol, acetic acid, succinic acid, gluconic acid, and formic acid.

17. (previously presented) The method according to claim 14, wherein (a) the one of the at least one organism-enzyme is  $\alpha$ -amylase; (b)  $\alpha$ -amylase catalyzes the hydrolysis of starch to form glucose; (c) one of the more than one sol-gel enzymes is glucose oxidase for catalyzing glucose oxidation to form gluconic acid and  $H_2O_2$ ; (d) gluconic acid and  $H_2O_2$  modulate the electrical resistance of the inherently conductive polymer transducer material; (e) and the modulated electrical resistance of the inherently conductive polymer transducer material is measured with a voltage source and ohmmeter.

18. (canceled)

19. (previously presented) The method of claim 14, wherein the substrate is selected from the group consisting of glass, ceramic, and plastic.

20. (currently amended) The method of claim ~~[[18]]~~14, wherein said electrodes comprise one or more elements selected from the group consisting of gold, platinum, silver, copper, and combinations thereof.

21. (currently amended) The method of claim ~~[[18]]~~14, wherein said electrodes are interdigitated.

22. (previously presented) The method of claim 14, wherein said sol gel matrix covers the substrate and the electrodes.

23. (previously presented) The method of claim 14, wherein said sol gel matrix is an encapsulating sol gel, said encapsulating sol gel matrix comprising at least one organosilane, which can be tetrafunctional, like tetramethoxy orthosilicate, trifunctional, like methyltrimethoxysilane, octadecyltrichlorosilane, octadecyltriethoxysilane, phenyltrimethoxysilane and 1,4-bis(trimethoxysilyl)ethyl)benzene, or difunctional, like methyldimethoxysilane, dimethyldiethoxysilane, or monofunctional, like octadecyldimethylmethoxysilane, or

derivatized silanes, like 2-(3,4-epoxycyclohexyl)-ethyltrimethoxysilane, 3-aminopropyltrimethoxysilane, 4-aminobutyldimethoxysilane, N-(2-aminoethyl)-3-aminopropylmethyldimethoxysilane, 5-(bicycloheptenyl)-triethoxy-silane, dicyclohexyldimethoxysilane and 3-glycidylpropyltrimethoxysilane.

24. (previously presented) The method of claim 14, wherein said sol gel matrix encapsulates said more than one sol-gel enzyme.

25. (previously presented) The method of claim 14, wherein said more than one sol-gel enzymes are selected from the group consisting of tryptophanase, gelatinase,  $\beta$ -lactamase, catalase, casease, citrase, decarboxylase, deoxyribonuclease, lipase, nitrate reductase,  $\beta$ -galactosidase, cytochrome oxidase, phenylalanine deaminase, 1-pyrrolidonyl arylamidase, cysteine desulfase, urease, L-asparaginase, glutamate dehydrogenase, organophosphorus hydrolase, acetylcholinesterase,  $\alpha$ -amylase and glucose oxidase.

26. (previously presented) The method of claim 14, wherein said transducer material and said reactant are dispersed in said sol gel matrix.

27. (previously presented) The method of claim 14, wherein said reactant is starch containing amylose.

28. (canceled)

29. (previously presented) The method of claim 14, wherein said inherently conductive polymer transducer material is a water soluble polymer.

30. (previously presented) The method of claim 29, wherein said water-soluble polymer is selected from the group consisting of polyaniline, polythiophenes, polyacetylenes, polypyrroles, and combinations thereof.

31. (previously presented) The method of claim 14, wherein said electrodes comprise one or more inherently conductive metals and combinations thereof.

32. (previously presented) The method of claim 14, wherein said sol gel matrix is an encapsulating sol gel matrix, said encapsulating sol gel matrix comprises at least one organosilane.

33. (new) A method of organism detection, said method comprising:  
utilizing a reactant to react with an enzyme so as to form a product;  
utilizing a different enzyme to react with said product so as to form a plurality of different products; and  
identifying a presence of an organism associated with said enzyme based on said plurality of different products modulating an electrical resistance of a transducer.